

WHAT IS CLAIMED IS:

- 5 *Sub a* } 1. A transmission line monitoring
apparatus for monitoring faults occurring in a
transmission line and in apparatus which are
connected to the transmission line, said
10 transmission line monitoring apparatus comprising:
 a first optical coupling unit which
couples a down data signal of a first wavelength and
an examination signal of a second wavelength so as
to transmit a first coupled signal to a lower
15 apparatus;
 a first optical dividing unit which
receives said first coupled signal from said optical
coupling unit so as to divide said first coupled
signal into said down data signal with the first
20 wavelength and said examination signal with the
second wavelength;
 a second optical coupling unit which
couples an up data signal with the first wavelength
and said examination signal from said first optical
25 dividing unit so as to transmit a second coupled
signal toward a host apparatus;
 a second optical dividing unit which
receives said second coupled signal from said second
optical coupling unit so as to divide said second
30 coupled signal into said up data signal with the
first wavelength and said examination signal with
the second wavelength; and
 a monitoring unit which monitors a fault
and a location of said fault.
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2. The transmission line monitoring apparatus as claimed in claim 1, wherein said first optical coupling unit, said first optical dividing unit, said second optical coupling unit, and said second optical dividing unit are formed of passive elements.

3. The transmission line monitoring apparatus as claimed in claim 2, further comprising a first examination signal generator which generates said examination signal with the second wavelength.

4. The transmission line monitoring apparatus as claimed in claim 3, wherein said monitoring unit includes:
an alarm information output unit which monitors a signal level of said examination signal with the second wavelength and, if said signal level is lower than a predetermined signal level, then outputs alarm information; and
an alarm information displaying/transferring unit which, when said alarm information is outputted, displays said alarm information and insert said alarm information into said up data signal to be transmitted to said host apparatus.

5. The transmission line monitoring

apparatus as claimed in claim 2, further comprising
a second examination signal generator which divides
an input down data signal into two signals, one
signal being converted into said down data signal
5 with the first wavelength, the other signal being
converted into said examination signal with the
second wavelength.

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6. The transmission line monitoring
apparatus as claimed in claim 5, wherein said
monitoring unit includes:

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an error information output unit which
outputs synchronous error information and data
signal error information based on said examination
signal with the second wavelength; and

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an error information
displaying/transferring unit which, when said
synchronous error information and said data signal
error information are outputted, displays said error
information and inserts said error information into
said up data signal to be transmitted to said host
25 apparatus.

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7. The transmission line monitoring
apparatus as claimed in claim 3, further comprising
a first control unit which controls a start and stop
of said first examination signal generator.

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8. The transmission line monitoring

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apparatus as claimed in claim 4, further comprising
a second control unit which controls start and stop
of said alarm information output unit and start and
stop of said alarm information display/transferring
5 unit.

10 9. The transmission line monitoring
apparatus as claimed in claim 7, further comprising
a timer for managing said first control unit at
given intervals.

15 10. The transmission line monitoring
apparatus as claimed in claim 8, further comprising
20 a command detecting unit which detects a command
signal included in said down data signal so as to
manage said first control unit based on said command
signal.

25 11. The transmission line monitoring
apparatus as claimed in claim 9, further comprising
30 a command detecting unit which detects a command
signal included in said down data signal so as to
manage said first control unit based on said command
signal.

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ar* 12. A transmission line monitoring method
for monitoring faults occurring in a transmission

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line and in apparatus connected to the transmission line, said transmission line monitoring method comprising the steps of:

- 5 (a) coupling a down data signal with a first wavelength and an examination signal with a second wavelength so as to transmit a first coupled signal to a lower apparatus;
- 10 (b) receiving said first coupled signal and dividing said first coupled signal into said down data signal with the first wavelength and said examination signal with the second wavelength;
- 15 (c) coupling an up data signal with the first wavelength and said examination signal with the second wavelength so as to transmit a second coupled signal towards a host apparatus;
- (d) receiving said second coupled signal and dividing said second coupled signal into said up data signal with the first wavelength and said examination signal with the second wavelength; and
- 20 (e) monitoring a fault and a location of said fault.

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